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(12) **United States Patent**
Gustine et al.

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(54) **CLAMPING RECEPTACLE**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(51) **Int. Cl.**[7] **H05K 5/00**
(52) **U.S. Cl.** **174/52.1**; 361/796
(58) **Field of Search** 174/52.1, 50.5; 361/627, 633, 641, 658, 736, 728, 752, 754, 796, 797, 798

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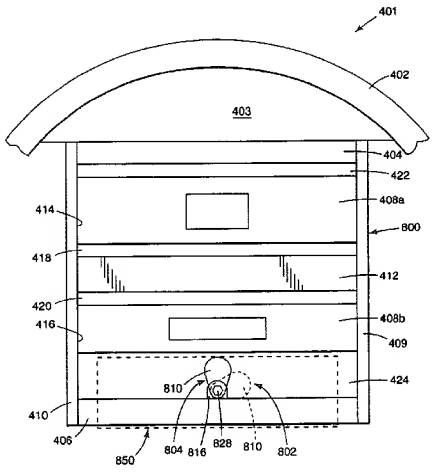
(57) **ABSTRACT**

A receptacle for confining circuit cards to different locations within a housing and that has a frame is provided. The frame has an array of slots, each containing one of the circuit cards. In one embodiment, the receptacle has a cam that is selectively engageable with the frame for clamping the circuit cards within the frame. In another embodiment, a shaft is rotatably attached to the receptacle. The shaft has a head at one end and a nut opposite the head. A resilient element is disposed on the shaft between the head and the nut. The resilient element is axially compressible between the head and nut to bulge generally perpendicularly to the axial direction into engagement with the frame for clamping the circuit cards within the frame.

39 Claims, 17 Drawing Sheets



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2000 has two compartments 2002 that are closed by covers 2004. Each of compartments 2002 receives a case 1800, as shown in FIG. 20, which, in one embodiment, is thermally coupled to housing 2000, as described in U.S. patent application Ser. No. 09/804,129, entitled MECHANICAL HOUSING, which application is incorporated herein by reference.

CONCLUSION

Embodiments of the present invention have been described. The embodiments provide cases that clamp circuit cards within them to improve the thermal contact between the circuit cards and the cases, thereby reducing the risk of thermal failure.

Although specific embodiments have been illustrated and described in this specification, it will be appreciated by those of ordinary skill in the art that any arrangement that is calculated to achieve the same purpose may be substituted for the specific embodiment shown. This application is intended to cover any adaptations or variations of the present invention. For example, although cam 810 is portrayed in the accompanying figures as being oval, cam 810 can also be circular, elliptical, or any suitable shape. Moreover, serrations 412, as shown in FIG. 10, can be eliminated from the curved surface of cam 810, or serrations 412 can be of a material other than rubber, such as plastic, metal, or the like. Although resilient elements 1202 and 1204 are shown to be hollow cylinders in FIG. 13, resilient elements 1202 and 1204 can have other geometries, such as cubes having apertures passing through them. Further, although cams 1611 are rotatably attached to end wall 1606, as shown in FIG. 16, and are rotatable into engagement with frame 1608, cams 1611 can be rotatably attached to frame 1608 and can be rotated into engagement with end wall 1606. Although cams 1825 are rotatably attached to frame 1808, as shown in FIG. 18, and are rotatable into engagement with frame 1809, cams 1825 can be rotatably attached to frame 1809 and can be rotatable into engagement with frame 1808.

What is claimed is:

1. A receptacle for confining circuit cards to different locations within a housing, the receptacle comprising:

a frame comprising an array of adjustable slots, the frame being thermally coupled to the housing, each slot containing one of the circuit cards; and

a cam selectively engageable with the frame for clamping the circuit cards within-the frame and thermally coupling the circuit cards to the frame.

2. The receptacle of claim 1, wherein the frame is partitioned into first and second sub-frames by a first partition and each of the first and second sub-frames partitioned into an array of slots by a plurality of second partitions.

3. The receptacle of claim 2, wherein the first sub-frame is movable relative to the second sub-frame and is in slidable contact with the receptacle.

4. The receptacle of claim 3, wherein the first partition is in slidable contact with the receptacle.

5. The receptacle of claim 4, wherein the cam is engageable with the first sub-frame for sliding the first sub-frame so that circuit cards that are in the first sub-frame contact the first partition and sliding the first partition into contact with the circuit cards of the second sub-frame to clamp the circuit cards contained in the slots of the first sub-frame between the first sub-frame and the first partition and the circuit cards contained in the slots of the second sub-frame between the first partition and the second sub-frame.

6. The receptacle of claim 1, wherein the cam is selected from the group consisting of a pair of cams in tandem, a pair of cams, and two tandem pairs of cams.

7. The receptacle of claim 1, wherein the cam is disposed within the receptacle.

8. The receptacle of claim 1, wherein the cam is rotatably attached to the receptacle.

9. The receptacle of claim 1, wherein the cam is disposed on a shaft that rotates the cam into and out of engagement with the frame.

10. The receptacle of claim 1, wherein the cam comprises a curved surface comprising serrations.

11. The receptacle of claim 1, wherein the frame comprises a pair of frames, the cam attached to one of the pair of frames and selectively engageable with the other of the pair of frames for clamping the circuit cards within each of the pair of frames.

12. A receptacle for confining circuit cards to different locations within a housing, the receptacle comprising:

at least one frame partitioned into first and second sub-frames by a first partition, each of the first and second sub-frames partitioned into an array of adjustable slots by a plurality of second partitions, each adjustable slot containing one of the circuit cards, the at least one frame being thermally coupled to the housing; and

at least one cam selectively engageable with the first sub-frame to clamp the circuit cards within the at least one frame, wherein the circuit cards are further thermally coupled to the at least one frame when the at least one cam is engaged with the first sub-frame.

13. The receptacle of claim 12, wherein the at least one cam is selected from the group consisting of a pair of cams in tandem, a pair of cams, and two tandem pairs of cams.

14. The receptacle of claim 12, wherein the at least one cam is disposed within the receptacle.

15. The receptacle of claim 12, wherein the at least one cam is rotatably attached to the receptacle.

16. The receptacle of claim 12, wherein the at least one cam is disposed on a shaft that rotates the at least one cam into and out of engagement with the first sub-frame.

17. The receptacle of claim 12, wherein the at least one cam comprises a curved surface comprising serrations.

18. The receptacle of claim 12, wherein the first sub-frame is movable relative to the second sub-frame and is in slidable contact with the receptacle.

19. The receptacle of claim 18, wherein the first partition is in slidable contact with the receptacle.

20. The receptacle of claim 19, wherein the at least one cam is engageable with the first sub-frame for sliding the first sub-frame so that circuit cards that are in the first sub-frame contact the first partition and sliding the first partition into contact with the circuit cards of the second sub-frame to clamp the circuit cards contained in the slots of the first sub-frame between the first sub-frame and the first partition and the circuit cards contained in the slots of the second sub-frame between the first partition and the second sub-frame.

21. A receptacle for confining circuit cards to different locations within a housing, the receptacle comprising:

at least one frame thermally coupled to the housing partitioned into first and second sub-frames by a first partition, each of the first and second sub-frames partitioned into an array of adjustable slots by a plurality of second partitions, each adjustable slot containing one of the circuit cards;

wherein the first sub-frame is movable relative to the second sub-frame and is in slidable contact with the receptacle;

wherein the first partition is in slidable contact with the receptacle; and

at least one cam disposed within the receptacle and rotatably attached to the receptacle, the at least one cam selectively rotatable for selectively engaging the first sub-frame for sliding the first sub-frame so that circuit cards of the first sub-frame contact the first partition and sliding the first partition into contact with the circuit cards of the second sub-frame to clamp the circuit cards contained in the adjustable slots of the first sub-frame between the first sub-frame and the first partition and the circuit cards contained in the slots of the second sub-frame between the first partition and the second sub-frame, wherein the circuit cards are thermally coupled to the frame when the at least one cam is engaged to the first sub-frame.

22. The receptacle of claim **21**, wherein the at least one cam is selected from the group consisting of a pair of cams in tandem, a pair of cams, and two tandem pairs of cams.

23. The receptacle of claim **21**, wherein the at least one cam is disposed on a shaft that rotates the at least one cam into and out of engagement with the first sub-frame.

24. A receptacle for confining circuit cards to different locations within a housing, the receptacle comprising:

first and second frames thermally coupled to the housing each of the first and second frames partitioned into first and second sub-frames by a first partition, each of the first and second sub-frames partitioned into an array of adjustable slots by a plurality of second partitions, each adjustable slot containing one of the circuit cards; and

at least one cam disposed between the first and second frames, the at least one cam rotatably attached to the first frame and adapted to engage the second frame to exert a force on each of the first and second frames for clamping the circuit cards within the first and second frames and thermally coupling the circuit cards to the first and second frames.

25. The receptacle of claim **24**, wherein the at least one cam is selected from the group consisting of a pair of cams in tandem, a pair of cams, and two tandem pairs of cams.

26. The receptacle of claim **24**, wherein the at least one cam is disposed on a shaft that is rotatably attached to the first frame, the shaft rotating the at least one cam into and out of engagement with the second frame.

27. The receptacle of claim **24**, wherein the at least one cam comprises a curved surface comprising serrations.

28. The receptacle of claim **24**, wherein the first sub-frame of each of the first and second frames is movable relative to the second sub-frame of each of the first and second frames and is in slidable contact with the receptacle.

29. The receptacle of claim **28**, wherein the first partition of each of the first and second frames is in slidable contact with the receptacle.

30. The receptacle of claim **24**, wherein the receptacle is thermally coupled to the housing.

31. A receptacle for confining circuit cards to different locations within a housing, the receptacle comprising:

first and second frames, each of the first and second frames partitioned into first and second sub-frames by a first partition, each of the first and second sub-frames partitioned into an array of slots by a plurality of second partitions, each slot containing one of the circuit cards;

at least one earn disposed between the first and second frames, the at least one cam rotatably attached to the first frame and adapted to engage the second frame to exert a force on each of the first and second frames for clamping the circuit cards within the first and second frames;

wherein the first sub-frame of each of the first and second frames is movable relative to the second sub-frame of each of the first and second frames and is in slidable contact with the receptacle;

wherein the first partition of each of the first and second frames is in slidable contact with the receptacle; and

wherein the force exerted on the first and second frames slides the first sub-frame of each of the first and second frames so that circuit cards of the first sub-frame of each of the first and second frames contact the first partition of each of the first and second frames and slides the first partition of each of the first and second frames into contact with the circuit cards of the second sub-frame of each of the first and second frames to clamp the circuit cards contained in the slots of the first sub-frame of each of the first and second frames between the first sub-frame and the first partition of each of the first and second frames and the circuit cards contained in the slots of the second sub-frame of each of the first and second frames between the first partition and the second sub-frame of each of the first and second frames.

32. A receptacle for confining circuit cards to different locations within a housing, the receptacle comprising:

first and second frames thermally coupled to the housing, each of the first and second frames partitioned into first and second sub-frames by a first partition, each of the first and second sub-frames partitioned into an array of adjustable slots by a plurality of second partitions, each adjustable slot containing one of the circuit cards;

wherein the first sub-frame of each of the first and second frames is movable relative to the second sub-frame of each of the first and second frames and is in slidable contact with the receptacle;

wherein the first partition of each of the first and second frames is in slidable contact with the receptacle; and

at least one cam disposed between the first and second frames, the at least one cam rotatably attached to the first sub-frame of the first frame and is selectively rotatable for engaging the first sub-frame of the second frame to exert a force on the first sub-frame of each of the first and second frames to slide the first sub-frame of each of the first and second frames so that circuit cards of the first sub-frame of each of the first and second frames contact the first partition of each of the first and second frames and to slide the first partition of each of the first and second frames into contact with the circuit cards of the second sub-frame of each of the first and second frames to clamp the circuit cards contained in the slots of the first sub-frame of each of the first and second frames between the first sub-frame and the first partition of each of the first and second frames and the circuit cards contained in the slots of the second sub-frame of each of the first and second frames between the first partition and the second sub-frame of each of the first and second frames, wherein the circuit cards are thermally coupled to the first and second frames respectfully when the at least one cam is engaged with the first sub-frame.

33. The receptacle of claim **32**, wherein the at least one cam is selected from the group consisting of a pair of cams in tandem, a pair of cams, and two tandem pairs of cams.

34. The receptacle of claim **32**, wherein the at least one cam is disposed on a shaft that is rotatably attached to the first sub-frame of the first frame, the shaft rotating the at least one cam into and out of engagement with the first sub-frame of the second frame.

35. The receptacle of claim **32**, wherein the receptacle is thermally coupled to the housing.

36. A receptacle for confining circuit boards, the receptacle comprising:

at least one frame thermally coupled to the housing, each frame having at least one adjustable slot, wherein the at least one adjustable slot is adapted to receive a circuit card;

at least one cam adapted to selectively apply force on the frame to adjust the size of the slot, wherein when the at least one cam applies a force on the frame, the size of the at least one adjustable slot is reduced to clamp a circuit card therein and thermally couple the circuit card to the frame.

37. The receptacle of claim **36**, wherein the at least one frame further comprises:

two or more sub-frames, and

sliding partitions separating the two or more sub-frames.

38. The receptacle of claim **36**, wherein the at least one frame includes a first and second frame;

the first and second frames being received in the receptacle approximate each other; and

the at least one cam coupled to the first frame.

39. The receptacle of claim **36**, further comprising:

the at least one cam selectively engaging the second frame.

* * * * *

PTO/SB/44 (06-07)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,897,377

APPLICATION NO. : 09/919,006

ISSUE DATE : 5/4/2005

INVENTOR(S) : Gustine, et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Under Other Publications on the face of the issued patent, please add the following reference:
Su, "Case for Mounting Slidably a Data Storage Medium in a Computer Housing" US Patent Publication No. US 2002/0141153 A1, Filed 07/09/01, Published 10/03/2002.

At Claim 31, Column 13, Line 60, please replace "earn" with "cam"

MAILING ADDRESS OF SENDER(Please do not use customer number below):

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Minneapolis, MN 55402

Applicants	Gustine et al.	**COMMUNICATION REGARDING CERTIFICATE OF CORRECTION**
Patent No.	6,897,377	
Issue Date	5/4/2005	
Serial No.	09/919,006	
Attorney Docket No.	100.216US01	
Title: CLAMPING RECEPTACLE		

ATTN: Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Applicants hereby request issuance of a Certificate of Correction in U.S. Letters Patent No. 6,897,377 as specified on the attached Certificate (Form PTO/SB/44). Please find enclosed documentation supporting errors identified in the above noted patent, referred to herein as Exhibits A, B and C. Exhibit A is a copy of the face and the claims of the issued patent.

With respect to the error identified on the face of the issued patent, Exhibit B comprises a copy of a supplemental IDS Form PTO-1449 acknowledged as received in the U.S. Patent & Trademark Office on January 12, 2004 and reviewed by the Examiner on August 7, 2004.

With respect to the error identified in claim 31 of the issued patent, Exhibit C comprises an amended listing of claims, including claim 31 of the issued patent, from pages 1-13 of an Amendment and Response filed with the U.S. Patent & Trademark Office under 37 CFR § 1.116 on November 8, 2004. The identified error constitutes a typographical error, and, as such, does not introduce new matter.

Applicants believe these corrections as specified are due to Office errors and therefore does not believe that any fee is due for issuance of a Certificate of Correction. However, if deemed necessary, the Office is authorized to charge any additional fees found due to Deposit Account No. 502432. Please contact the undersigned if there are any further questions.

Respectfully submitted,

Date: August 29, 2007 /David D. Freitag/

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Exhibit C

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Applicant(s)	Gary Gustine
Serial No.	09/919,006
Filing Date	July 31, 2001
Group Art Unit	2831
Examiner Name	Adolfo Nino
Facsimile No.	703-872-9306
Confirmation No.	3212
Attorney Docket No.	300.216US01

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Title: CLAMPING RECEPTACLE

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Enclosures

The following documents are enclosed:

X An Amendment and Response under 37 C.F.R. 1.116 (13 pgs.).

Please charge any additional fees or credit any overpayments to Deposit Account No. 502432.

Submitted By

Name	Scott Lundberg	Reg. No.	41,958	Telephone	(612) 332-4720
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Name	Elizabeth A. Bauer	Signature	Elizabeth A. Bauer

PAGE 1/14 * RCVD AT 11/8/2004 4:08:58 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/3 * DNIS:8729306 * CSID:612 332 4731 * DURATION (mm-ss):03-30

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Enclosures

The following documents are enclosed:

X An Amendment and Response under 37 C.F.R. 1.116 (13 pgs.).

Please charge any additional fees or credit any overpayments to Deposit Account No. 502432.

Submitted By

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Certificate of Transmission

Applicant(s)	Gary Gustine
Serial No.	09/919,006
Filing Date	July 31, 2001
Group Art Unit	2831
Examiner Name	Adolfo Nino
Facsimile No.	703-872-9306
Confirmation No.	3212
Attorney Docket No.	100.216US01

FACSIMILE TRANSMITTAL FORM

Title: CLAMPING RECEPTACLE

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Certificate of Transmission

I certify that this paper, and the above-identified documents, are being transmitted by facsimile to, Examiner Adolfo Nino, Group Art Unit 2831 (Facsimile No. 703-872-9306) of the United States Patent and Trademark Office on November 8, 2004.

Name	Elizabeth A. Bauer	Signature	Elizabeth A. Bauer

Applicant(s)	Gustine	**AMENDMENT AND RESPONSE UNDER 37 C.F.R. § 1.116 EXPEDITED EXAMINATION PROCEDURE**
Serial No.	09/919,006	
Filing Date	7/31/2001	
Group Art Unit	2831	
Examiner Name	Adolfo Nino	
Confirmation No.	3212	
Attorney Docket No.	100.216US01	
Title: CLAMPING RECEPTACLE		

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Applicants have reviewed the Final Office Action mailed on August 11, 2004. Please amend the above-identified application as follows.

Amendments to the Claims are reflected in the listing of claims that begins on page 2 of this paper.

Remarks begin on page 11 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of claims:

1. (Currently amended) A receptacle for confining circuit cards to different locations within a housing, the receptacle comprising:

a frame comprising an array of slots, the frame being thermally coupled to the housing, each slot containing one of the circuit cards; and

a cam selectively engageable with the frame for clamping the circuit cards within the frame and thermally coupling the circuit cards to the frame.

2. (Original) The receptacle of claim 1, wherein the frame is partitioned into first and second sub-frames by a first partition and each of the first and second sub-frames partitioned into an array of slots by a plurality of second partitions.

3. (Original) The receptacle of claim 2, wherein the first sub-frame is movable relative to the second sub-frame and is in slidable contact with the receptacle.

4. (Original) The receptacle of claim 3, wherein the first partition is in slidable contact with the receptacle.

5. (Original) The receptacle of claim 4, wherein the cam is engageable with the first sub-frame for sliding the first sub-frame so that circuit cards that are in the first sub-frame contact the first partition and sliding the first partition into contact with the circuit cards of the second sub-frame to clamp the circuit cards contained in the slots of the first sub-frame between

the first sub-frame and the first partition and the circuit cards contained in the slots of the second sub-frame between the first partition and the second sub-frame.

6. (Original) The receptacle of claim 1, wherein the cam is selected from the group consisting of a pair of cams in tandem, a pair of cams, and two tandem pairs of cams.

7. (Original) The receptacle of claim 1, wherein the cam is disposed within the receptacle.

8. (Original) The receptacle of claim 1, wherein the cam is rotatably attached to the receptacle.

9. (Original) The receptacle of claim 1, wherein the cam is disposed on a shaft that rotates the cam into and out of engagement with the frame.

10. (Original) The receptacle of claim 1, wherein the cam comprises a curved surface comprising serrations.

11. (Original) The receptacle of claim 1, wherein the frame comprises a pair of frames, the cam attached to one of the pair of frames and selectively engageable with the other of the pair of frames for clamping the circuit cards within each of the pair of frames.

12. (Currently Amended) A receptacle for confining circuit cards to different locations within a housing, the receptacle comprising:

at least one frame partitioned into first and second sub-frames by a first partition, each of the first and second sub-frames partitioned into an array of slots by a plurality of second partitions, each slot containing one of the circuit cards, the at least one frame being thermally coupled to the housing; and

at least one cam selectively engageable with the first sub-frame to clamp the circuit cards within the at least one frame, wherein the circuit cards are further thermally coupled to the at least one frame when the at least one cam is engaged with the first sub-frame.

13. (Original) The receptacle of claim 12, wherein the at least one cam is selected from the group consisting of a pair of cams in tandem, a pair of cams, and two tandem pairs of cams.

14. (Original) The receptacle of claim 12, wherein the at least one cam is disposed within the receptacle.

15. (Original) The receptacle of claim 12, wherein the at least one cam is rotatably attached to the receptacle.

16. (Original) The receptacle of claim 12, wherein the at least one cam is disposed on a shaft that rotates the at least one cam into and out of engagement with the first sub-frame.

17. (Original) The receptacle of claim 12, wherein the at least one cam comprises a curved surface comprising serrations.

18. (Original) The receptacle of claim 12, wherein the first sub-frame is movable relative to the second sub-frame and is in slidable contact with the receptacle.

19. (Original) The receptacle of claim 18, wherein the first partition is in slidable contact with the receptacle.

20. (Original) The receptacle of claim 19, wherein the at least one cam is engageable with the first sub-frame for sliding the first sub-frame so that circuit cards that are in the first sub-frame contact the first partition and sliding the first partition into contact with the circuit cards of the second sub-frame to clamp the circuit cards contained in the slots of the first sub-frame between the first sub-frame and the first partition and the circuit cards contained in the slots of the second sub-frame between the first partition and the second sub-frame.

21. (Currently amended) A receptacle for confining circuit cards to different locations within a housing, the receptacle comprising:

at least one frame thermally coupled to the housing partitioned into first and second sub-frames by a first partition, each of the first and second sub-frames partitioned into an array of slots by a plurality of second partitions, each slot containing one of the circuit cards;

wherein the first sub-frame is movable relative to the second sub-frame and is in slidable contact with the receptacle;

wherein the first partition is in slidable contact with the receptacle; and

at least one cam disposed within the receptacle and rotatably attached to the receptacle, the at least one cam selectively rotatable for selectively engaging the first sub-frame for sliding the first sub-frame so that circuit cards of the first sub-frame contact the first partition and sliding the first partition into contact with the circuit cards of the second sub-frame to clamp the circuit cards contained in the slots of the first sub-frame between the first sub-frame and the first partition and the circuit cards contained in the

slots of the second sub-frame between the first partition and the second sub-frame[.], wherein the circuit cards are thermally coupled to the frame when the at least one cam is engaged to the first sub-frame.

22. (Original) The receptacle of claim 21, wherein the at least one cam is selected from the group consisting of a pair of cams in tandem, a pair of cams, and two tandem pairs of cams.

23. (Original) The receptacle of claim 21, wherein the at least one cam is disposed on a shaft that rotates the at least one cam into and out of engagement with the first sub-frame.

24. (Currently Amended) A receptacle for confining circuit cards to different locations within a housing, the receptacle comprising:

first and second frames thermally coupled to the housing, each of the first and second frames partitioned into first and second sub-frames by a first partition, each of the first and second sub-frames partitioned into an array of slots by a plurality of second partitions, each slot containing one of the circuit cards; and

at least one cam disposed between the first and second frames, the at least one cam rotatably attached to the first frame and adapted to engage the second frame to exert a force on each of the first and second frames for clamping the circuit cards within the first and second frames and thermally coupling the circuit cards to the first and second frames.

25. (Original) The receptacle of claim 24, wherein the at least one cam is selected from the group consisting of a pair of cams in tandem, a pair of cams, and two tandem pairs of cams.

26. (Original) The receptacle of claim 24, wherein the at least one cam is disposed on a shaft that is rotatably attached to the first frame, the shaft rotating the at least one cam into and out of engagement with the second frame.

27. (Original) The receptacle of claim 24, wherein the at least one cam comprises a curved surface comprising serrations.

28. (Original) The receptacle of claim 24, wherein the first sub-frame of each of the first and second frames is movable relative to the second sub-frame of each of the first and second frames and is in slidable contact with the receptacle.

29. (Original) The receptacle of claim 28, wherein the first partition of each of the first and second frames is in slidable contact with the receptacle.

30. (Currently amended) ~~The receptacle of claim 29,~~ A receptacle for confining circuit cards to different locations within a housing, the receptacle comprising:

first and second frames, each of the first and second frames partitioned into first and second sub-frames by a first partition, each of the first and second sub-frames partitioned into an array of slots by a plurality of second partitions, each slot containing one of the circuit cards;

at least one cam disposed between the first and second frames, the at least one cam rotatably attached to the first frame and adapted to engage the second frame to exert a force on each of the first and second frames for clamping the circuit cards within the first and second frames;

wherein the first sub-frame of each of the first and second frames is movable relative to the second sub-frame of each of the first and second frames and is in slidable contact with the receptacle;

wherein the first partition of each of the first and second frames is in slidable contact with the receptacle; and

wherein the force exerted on the first and second frames slides the first sub-frame of each of the first and second frames so that circuit cards of the first sub-frame of each of the first and second frames contact the first partition of each of the first and second frames and slides the first partition of each of the first and second frames into contact with the circuit cards of the second sub-frame of each of the first and second frames to clamp the circuit cards contained in the slots of the first sub-frame of each of the first and second frames between the first sub-frame and the first partition of each of the first and second frames and the circuit cards contained in the slots of the second sub-frame of each of the first and second frames between the first partition and the second sub-frame of each of the first and second frames.

31. (Original) The receptacle of claim 24, wherein the receptacle is thermally coupled to the housing.

32. (Currently Amended) A receptacle for confining circuit cards to different locations within a housing, the receptacle comprising:

first and second frames thermally coupled to the housing, each of the first and second frames partitioned into first and second sub-frames by a first partition, each of the first and second sub-frames partitioned into an array of slots by a plurality of second partitions, each slot containing one of the circuit cards;

wherein the first sub-frame of each of the first and second frames is movable relative to the second sub-frame of each of the first and second frames and is in slidable contact with the receptacle;

wherein the first partition of each of the first and second frames is in slidable contact with the receptacle; and

at least one cam disposed between the first and second frames, the at least one cam rotatably attached to the first sub-frame of the first frame and is selectively rotatable for engaging the first sub-frame of the second frame to exert a force on the first sub-frame of each of the first and second frames to slide the first sub-frame of each of the first and second frames so that circuit cards of the first sub-frame of each of the first and second frames contact the first partition of each of the first and second frames and to slide the first partition of each of the first and second frames into contact with the circuit cards of the second sub-frame of each of the first and second frames to clamp the circuit cards contained in the slots of the first sub-frame of each of the first and second frames between the first sub-frame and the first partition of each of the first and second frames and the circuit cards contained in the slots of the second sub-frame of each of the first and second frames between the first partition and the second sub-frame of each of the first and second frames[.],wherein the circuit cards are thermally coupled to the first and second frames respectfully when the at least one cam is engaged with the first sub-frame.

33. (Original) The receptacle of claim 32, wherein the at least one cam is selected from the group consisting of a pair of cams in tandem, a pair of cams, and two tandem pairs of cams.

34. (Original) The receptacle of claim 32, wherein the at least one cam is disposed on a shaft that is rotatably attached to the first sub-frame of the first frame, the shaft rotating the at least one cam into and out of engagement with the first sub-frame of the second frame.

35. (Original) The receptacle of claim 32, wherein the receptacle is thermally coupled to the housing.

Claims 36-106 (Cancelled)

107. (Previously presented) A receptacle for confining circuit boards, the receptacle comprising:

at least one frame thermally coupled to the housing, each frame having at least one adjustable slot, wherein the at least one adjustable slot is adapted to receive a circuit card;

at least one cam adapted to selectively apply force on the frame to adjust the size of the slot, wherein when the at least one cam applies a force on the frame, the size of the at least one adjustable slot is reduced to clamp a circuit card therein and thermally couple the circuit card to the frame.

108. (Previously presented) The receptacle of claim 107, wherein the at least one frame further comprises:

two or more sub-frames, and

sliding partitions separating the two or more sub-frames.

109. (Previously presented) The receptacle of claim 107, wherein the at least one frame includes a first and second frame;

the first and second frames being received in the receptacle approximate each other; and

the at least one cam coupled to the first frame.

110. (Previously presented) The receptacle of claim 107, further comprising:

the at least one cam selectively engaging the second frame.

REMARKS

Applicant has reviewed the Final Office Action mailed on August 11, 2004, as well as the art cited. Claims 1, 12, 21, 24, 30 and 32 are currently amended. Claims 1-35 and 107-110 are pending in this application.

Rejections Under 35 U.S.C. § 102

Claims 1-9, 11-16, 18-26, 28, 29 and 31-35 were rejected under 35 USC § 102(b) as being anticipated by Farnworth et al., (U.S. Patent No. 5,995,378).

Rejections Under 35 U.S.C. § 103

Claims 10, 17 and 27 were rejected under 35 USC § 103(a) as being unpatentable over Farnworth in view of Jungersen (U.S. Patent No. 4,987,978).

Allowable Subject Matter

Claims 107-110 were allowed.

Claim 30 was objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Telephonic Interview

Applicant thanks the Examiner for the telephonic interview on October 28, 2004. The Applicant discussed the rejected claims. In particular, the Applicant discussed possible amendments that could be made to the rejected claims to get them allowed so the application could issue into a patent. The content of the allowed claims was discussed and the Examiner stated that if the rejected independent claims where amended to include the limitations in the allowed claim (claim 107) those rejected claims would also be allowed. Accordingly, the Applicant has amended the remaining rejected independent claims to include the limitations of the allowed claim. In particular, the Applicant has amended Claims 1, 12, 21, 24 and 32 to include language regarding the frame being thermally coupled to the housing and the circuit

cards being selectively thermally coupled to the frame. Therefore, the Applicant respectfully requests the withdrawal of the rejections of claims 1-29 and 31-35.

Applicant has further rewritten Claim 30 into an independent claim that includes all the limitation of its rejected base claim and intervening claims. As such the Applicant respectfully rejects the objection to Claim 30.

The Applicant has merely made the above amendments to get the case allowed. The Applicant, however, retains the right to file a continuation application having claims with a scope similar to those as originally filed.

CONCLUSION

Applicant respectfully submits that claims 1-35 and 107-110 are in condition for allowance and notification to that effect is earnestly requested. If necessary, please charge any additional fees or credit overpayments to Deposit Account No. 502432.

If the Examiner has any questions or concerns regarding this application, please contact the undersigned at 612-455-1690.

Respectfully submitted,

Date: 10-8-04

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Applicant(s)	Gary Gustine et al.
Serial No.	09/919,006
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Examiner Name	Adolfo Nino
Attorney Docket No.	100.216US01

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT FORM PTO-1449

Title: CLAMPING RECEPTACLE

Sheet 1 of 1

U.S. Patent References

Examiner Initials	Patent No.	Issue Date	Name	Filing Date
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	5,825,621	10/20/98	Giannatto et al.	08/22/97
	5,946,193	08/31/99	Hendrix et al.	09/12/97
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	6,510,223	01/21/03	Laetsch	09/14/01
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Foreign Patent References

Examiner Initials	Foreign Patent		Name	Publication Date	T?
	Country	No.			
	NONE				

Other References

Examiner Initials	Author, Title, Date, Pages, etc.
	Su, "Case for Mounting Slidably a Data Storage Medium in a Computer Housing" US Patent Publication No. US 2002/0141153 A1, Filed 07/09/01, Published 10/03/2002. (9 pgs.)

Examiner Signature	AN	Date Considered	8-7-04

*Examiner: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Based on Form PTO-FB-A820 Patent and Trademark Office, U.S. Department of Commerce